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| EXAMINER | |
|---|---|
| LEUNG, CHRISTINA Y | |
| **ART UNIT** | **PAPER NUMBER** |
| 2633 | 18 |

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Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/612,633 | MITUHASHI, TOMIO | |
| | Examiner | Art Unit | |
| | Christina Y. Leung | 2633 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *09 January 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *11-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 17, 19, and 22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 17 recites that the optical communication unit further comprises first and second converging lenses. However, claim 14 on which it depends, currently already recites first and second converging lenses. Applicants' specification does not appear to support an embodiment of the invention including a total of four lenses in the same optical communication unit.

3. Claims 19 and 22 each recite that the optical communication unit further comprises "a converging lens" Claim 14, on which the claims depend, already recites first and second converging lenses. While Applicants' specification supports an embodiment of the invention where instead of two converging lenses, only one is used (as shown in Figure 9), it does not specifically support an embodiment where another converging lens is used in addition to two converging lenses.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 15-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15 recites the limitation "said optical cable" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim because claim 14 on which it depends currently recites "a pair of optical fiber cables" and not "an optical cable," and it is unclear how the recited limitation (reciting that "said optical cable has a *pair* of paths") may correctly relate to one of previously claimed cables.

Claim 16 depends on claim 15 and is therefore also rejected under 35 U.S.C. 112, second paragraph for the above reason.

Claim 17 also recites "said optical cable" twice in lines 4-6 of the claim, and claim 18 recites "said optical cable in lines 5 and 7 of the claim. Again, there is insufficient antecedent basis for this limitation in the claims because claim 14 on which they each depend currently recites "a pair of optical fiber cables" and not "an optical cable," and it is unclear how the recited limitations may correctly relate to one of previously claimed cables.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Medved et al. (US 5,818,619 A) in view of Sandstedt (US 4,130,738 A).

Regarding claim 24, Medved et al. disclose (Figures 1 and 4) a cable-side optical communication unit 56 connectable with an apparatus-side optical communication unit 54 provided in an apparatus (i.e., terminal 50) and having a light transceiver section (including airlink receiver 21 and airlink transmitter 26 shown in Figure 1) to transmit/receive an optical signal to and from the apparatus for executing communication with a communication device, the cable-side optical communication unit comprising:

an optical module (the physical structure of unit 10) to house the light transceiver section and a buffer 25 to execute communications with the apparatus-side optical communication unit, wherein the light transceiver section is connected to one of a pair of optical fiber cables (fiber 18) to transmit the optical signal form the optical fiber cable to the apparatus, and the light transceiver section is connected to the other pair of optical fiber cables (fiber 19) to transmit the optical signal from the apparatus to the optical fiber;

a first converging lens 27 attached to the optical module, to converge the optical signal transmitted by the light transceiver section (specifically by transmitter 26) and to transmit the converged optical signal to the apparatus;

a second converging lens 23 attached to the optical module, to converge the optical signal transmitted by the apparatus and to transmit the converged optical signal to the light transceiver section (specifically to receiver 21).

Medved et al. disclose that the module houses buffer 25 (column 5, lines 40-45) but do not specifically disclose that the module houses an integrated circuit. However, it is well known in the art that a data buffer element such as the one already disclosed by Medved et al. may comprise an integrated circuit. Sandstedt in particular teach an optical communications system,

related to the one disclosed by Medved et al., including a buffer 28 and a light emitting section 38 for transmitting data stored in the buffer (Figure 2B). Sandstedt further teach that this buffer may be an integrated circuit (column 10, lines 23-27). It would have been obvious to a person of ordinary skill in the art to specifically use an integrated circuit as taught by Sandstedt in the module disclosed by Medved et al. as an engineering design choice of a well known way to provide the buffer element already disclosed. One in the art would have been particularly motivated to use an integrated circuit such as taught by Sandstedt in order to more readily manufacture the module by using a widely available type of buffer element.

Examiner notes that the claim does not further recite any specific details regarding the integrated circuit element.

8. Claims 11 and 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Medved et al. in view of Sandstedt and Ota (US 5,959,752 A).

Regarding claim 11, Medved et al. disclose (Figures 1 and 4) a cable-side optical communication unit 56 connectable with an apparatus-side optical communication unit 54 provided in an apparatus (i.e., terminal 50) for executing communication with a communicating partner by using optical signals, the cable-side optical communication unit comprising:

a light emitting section (including airlink transmitter 26 shown in Figure 1) to transmit an optical signal to the apparatus;

a light receiving section (including airlink receiver 21) to receive an optical signal from the apparatus;

an optical module (the physical structure of unit 10) to house the light emitting section, the light receiving section and a buffer 25 to execute communications with the apparatus-side

optical communication unit, wherein the light emitting section is connected to one of a pair of optical fiber cables (fiber 18) to transmit the optical signal from the optical fiber cable to the apparatus, and the light receiving section is connected to the other pair of optical fiber cables (fiber 19) to transmit the optical signal from the apparatus to the optical fiber;

a first converging lens 27 attached to the optical module, to converge the optical signal transmitted by the light emitting section 26 and to transmit the converged optical signal to the apparatus (column 5, lines 44-45); and

a second converging lens 23 attached to the optical module, to converge the optical signal transmitted by the apparatus and to transmit the converged optical signal to the light receiving section 21 (column 5, lines 29-30).

As similarly discussed above with regard to claim 24, Medved et al. disclose that the module houses buffer 25 (column 5, lines 40-45) but do not specifically disclose that the module houses an integrated circuit. However, it is well known in the art that a data buffer element such as the one already disclosed by Medved et al. may comprise an integrated circuit. Sandstedt in particular teach an optical communications system, related to the one disclosed by Medved et al., including a buffer 28 and a light emitting section 38 for transmitting data stored in the buffer (Figure 2B). Sandstedt further teach that this buffer may be an integrated circuit (column 10, lines 23-27). It would have been obvious to a person of ordinary skill in the art to specifically use an integrated circuit as taught by Sandstedt in the module disclosed by Medved et al. as an engineering design choice of a well known way to provide the buffer element already disclosed. One in the art would have been particularly motivated to use an integrated circuit such as taught

by Sandstedt in order to more readily manufacture the module by using a widely available type of buffer element.

Medved et al. do not specifically disclose a shielding section to optically shield light between the first converging lens and the second converging lens. However, it is well known in the art that it is generally undesirable for a light receiving section in a transceiver-type device to receive transmitted light from its own light emitting section, since it may interfere with the reception of the desired signals from its actual communication partner. Medved et al. already discloses lenses 23 and 27 for providing some direction/separation of the incoming and outgoing light.

Ota teaches an optical communication system related to the one disclosed by Medved et al., including a light emitting section 875 with an associated lens 877 and a light receiving section 876 with another associated lens (Figures 22A and 22B). Ota further teaches a shielding section (pipes 878) disposed to shield light between the emitting and receiving sections (column 16, lines 22-55). It would have been obvious to a person of ordinary skill in the art to including a shielding section as taught by Ota in the system disclosed by Medved et al. in order to further direct incoming and outgoing light and allow the light receiving section to receive desired communications without unwanted interference.

Regarding claim 12, Medved et al. further disclose a connecting section (connectors 16 and 17) with an optical cable unit (fibers 14 and 15), wherein the optical communication unit transmits and receives optical signals to and from the apparatus via the optical cable unit.

9. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Medved et al. in view of Sandstedt and Ota as applied to claim 11 above, and further in view of Kobayashi (US 5,986,785 A).

Regarding claim 13, Medved et al. in view of Sandstedt and Ota describe a system as discussed above with regard to claim 11. They do not specifically suggest an optical filter to cut off light on a path of the signal from the apparatus to the light receiving section, and the optical signal from the light emitting section to the apparatus.

However, it is well known in the art that a filter may be used to block unwanted light from an optical receiver; in fact, Ota already teaches a filter for this purpose (filters 15a and 15b in Figure 4A). It is also well known in the art that a filter may be used to further ensure that light from an emitter is of a particular wavelength range. Kobayashi in particular teach an optical communications system and further teach that a single optical filter 63 may also be placed in front of a light emitting section and a light receiving section arranged next to each other (Figure 1B; column 2, lines 58-67; column 3, lines 1-8). It would have been obvious to a person of ordinary skill in the art to use a filter as taught by Kobayashi in front of the emitting and receiving sections in the system described by Medved et al. in view of Sandstedt and Ota in order to block out unwanted light to and from the apparatus. One in the art would have been particularly motivated in include such a filter in order to ensure that communications are properly received without noise.

10. Claims 14, 15, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Medved et al. in view of Kobayashi.

Regarding claim 14, Medved et al. disclose (Figures 1 and 4) an optical communication unit (such as unit 54) provided between two apparatuses (such as terminal 50 shown in Figure 4, or even interface units 52 and 58) that perform optical communication with each other, the optical communication unit transmitting and receiving optical signal to and from the apparatuses, the optical communication unit comprising:

a connector (connectors 16 and 17) being connectable to any one of the apparatuses (unit 54 is connected to interface unit 52 in Figure 4);

a signal transmitting/receiving section including a light receiving section (including airlink receiver 21) to transmit an optical signal received from one of the apparatuses (interface unit 58), and a light emitting section (including airlink transmitter 26) to transmit an optical signal transmitted from the other of the apparatuses (interface unit 52) to the one of the apparatuses 58; and

an optical module (the physical structure of unit 10) to house the signal transmitting/receiving section such that the light emitting section is connected to one of a pair optical fiber cables 18 to receive the optical signal from the other of the apparatuses 52, and that the light receiving section is connected to the other of a pair of optical fiber cables 19 to transmit the optical signal from the one of the apparatuses 58 to optical fiber.

For clarification, Examiner again notes that in Figure 4, if the optical communication unit is unit 54, the "other of the apparatuses" as discussed above would be interface unit 52 and the "one of the apparatuses" would be interface unit 58.

Further regarding claim 14, Medved et al. also disclose that the optical module 10 includes a first converging lens 27 attached thereto to converge the optical signal transmitted by

the light emitting section 26, a second converging lens 23 attached thereto to converge the optical signal received at the light receiving section 21.

Medved et al. do not specifically disclose at least one window between the one of the apparatuses and the light receiving/emitting sections. However, as similarly discussed above with regard to claim 13, it is well known in the art that a filter may be used to block unwanted light from an optical receiver and that a filter may be used to further ensure that light from an emitter is of a particular wavelength range. Kobayashi in particular teach an optical communications system and further teach that a window 61a comprising a single optical filter 63 may also be placed in front of a light emitting section and a light receiving section arranged next to each other (Figure 1B; column 2, lines 58-67; column 3, lines 1-8). It would have been obvious to a person of ordinary skill in the art to use a filtering window as taught by Kobayashi in front of the emitting and receiving sections in the system disclosed by Medved et al. in order to block out unwanted light to and from the apparatus. One in the art would have been particularly motivated in include such a filtering window in order to ensure that communications are properly received without noise.

Regarding claim 15, as well as it may be understood with respect to 35 U.S.C. 112 discussed above, Medved et al. disclose that the pair of optical fiber cables are a pair of paths to transmit and receive optical signals from and to the one of the apparatuses, respectively.

Regarding claim 17, as well as it may be understood with respect to 35 U.S.C. 112 discussed above, Medved et al. disclose

a converging lens 23 to converge an optical signal from the one of the apparatuses and transmit the optical signal into one of the optical fiber cables 19; and

another converging lens 27 to converge an optical signal transmitted through one of the optical fiber cables 18 and transmit the optical signal to the one of the apparatuses.

Regarding claim 18 as well as it may be understood with respect to 35 U.S.C. 112 discussed above, Medved et al. disclose that the light receiving section has a first modulating/demodulating section to receive an optical signal transmitted from the one of the apparatuses and convert the optical signal to an electric signal (Figure 1 shows how the optical signal received by airlink receiver 21 is converted into an electric signal), and also to demodulate the electric signal to an optical signal and transmit the optical signal into the pair of optical cables (using transmitter TXU 20, which converts the electric signal back into an optical one for the fiber); and

the light emitting section has a second modulating/demodulating section to receive the optical signal transferred through the optical cable and to convert the optical signal to an electric signal (using receiver RXU 24, which converts the optical signal from the fiber into an electric one), and also to demodulate the electric signal to an optical signal and transmit the optical signal to the one of the apparatuses (the electrical signal received by airlink transmitter 26 is converted into an optical signal; see column 5, lines 14-46).

11. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Medved et al. in view of Kobayashi as applied to claims 14 and 15 above, and further in view of Ota.

Regarding claim 16, Medved et al. in view of Kobayashi describe a system as discussed above with regard to claims 14 and 15 above, but they do not specifically suggest a shielding section. However, as similarly discussed above with regard to claim 11, it is well known in the art that it is generally undesirable for a light receiving section in a transceiver-type device to

receive transmitted light from its own light emitting section, since it may interfere with the reception of the desired signals from its actual communication partner. Medved et al. already discloses lenses 23 and 27 for providing some direction/separation of the incoming and outgoing light.

Ota teaches an optical communication system related to the one disclosed by Medved et al., including a light emitting section 875 with an associated lens 877 and a light receiving section 876 with another associated lens (Figures 22A and 22B). Ota further teaches a shielding section (pipes 878) disposed to shield light between the emitting and receiving sections (column 16, lines 22-55). It would have been obvious to a person of ordinary skill in the art to including a shielding section as taught by Ota in the system described by Medved et al. in view of Kobayashi in order to further direct incoming and outgoing light and allow the light receiving section to receive desired communications without unwanted interference.

12. Claims 19, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Medved et al. in view of Kobayashi as applied to claim 14 above, and further in view of Tsuji et al. (US 5,664,035 A).

Regarding claims 19, 22, and 23, Medved et al. in view of Kobayashi describe a system as discussed above with regard to claim 14 above.

Regarding both claims 19 and 22, Medved et al. disclose converging lenses 23 and 27 arranged in paths of the optical signal. However, they do not specifically disclose that the unit further comprises a (single) converging lens arranged in light paths of the optical signal from the one of the apparatuses to the light receiving section and the optical signal from the light emitting section to the one of the apparatuses,

Similarly, regarding claim 23, Medved et al. do not specifically disclose that the light receiving section and the light emitting section are realized with one lens.

However, Tsuji et al. teach an optical communication system related to the one described by Medved et al. in view of Kobayashi and further teach a light emitting section 222 and a light receiving section 221 integrated to each other and covered with one lens, converging lens 231 (Figures 2a-b). They also teach that the converging lens 231 converges a signal from the apparatus to the cable 41 as well as from the cable to the apparatus (Figure 2a). Regarding claims 19, 22, and 23, it would have been obvious to a person of ordinary skill in the art to use a converging lens as taught by Tsuji et al. instead of the two lenses in the system described by Medved et al. in view of Kobayashi as an engineering design choice of an alternative way to focus and guide the incoming and outgoing signals between the optical fiber and the optical components. The claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art. One in the art may be particularly motivated to provide one converging lens as taught by Tsuji et al. instead of two simply for economic reasons depending on the availability/cost of a single lens arrangement over a two lens arrangement.

Further regarding claim 22 in particular, Medved et al. do not specifically disclose that the light receiving section and the light emitting section are integrated to each other. However, Tsuji et al. teach that a light emitting section 222 and a light receiving section 221 may be integrated to each other (column 5, lines 66-67; column 6, lines 1-2). It would have been obvious to a person of ordinary skill in the art to integrate the light receiving section and the light

emitting section in the system described by Medved et al. in view of Kobayash as taught by Tsuji et al. in order to arrange and manufacture the elements more efficiently.

13. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Medved et al. in view of Kobayashi as applied to claim 14 above, and further in view of Helot et al. (US 5,781,177 A).

Regarding claim 20, Medved et al. in view of Kobayashi describe a system as discussed above with regard to claim 14. They do not specifically suggest that the light receiving section may be changed according to a speed of an optical signal. However, it is well known in the art that optical signals transmitted at different speeds may have different characteristics at the receiver, such as different amounts of signal losses or errors. Helot et al. (Figures 1 and 4) teach that a light receiving section may switch between two different areas depending on characteristics of the incoming signal. In particular, they teach a receiver 40 for high-speed communications and a receiver 42 for low-speed communications. It would have been obvious to a person of ordinary skill in the art to include different receiving devices suited for different communication speeds as taught by Helot et al. in the system described by Medved et al. in view of Koabayashi in order to optimize reception of signals with different characteristics and increase the flexibility of the communications unit. One in the art would have been particularly motivated to include the different receiving devices taught by Helot et al. because the unit disclosed by Medved et al. is specifically concerned with providing an interface between different types of communicating elements.

14. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Medved et al. in view of Kobayashi as applied to claim 14 above, and further in view of Nguyen (US 5,940,209 A).

Regarding claim 21, Medved et al. in view of Kobayashi describe a system as discussed above with regard to claim 14. They do not specifically suggest that the light receiving section may be changed according a transmission distance of an optical signal. However, it is well known in the art that optical signals transmitted across different distances may have different characteristics at the receiver, such as different amounts of signal loss. Nguyen teaches that a light receiving section may change according to a transmission distance of an optical signal; in particular, Nguyen teaches changing an amplification of an optical signal according to a transmission distance of the signal (column 3, lines 4-14). It would have been obvious to a person of ordinary skill in the art to include a circuit which adjusts according to a transmission distance of the signal such as taught by Nguyen in the systems described by Medved et al. in view of Kobayashi in order to optimize reception of signals with different characteristics and increase the flexibility of the communications unit. Again, one in the art would have been particularly motivated to include the circuit taught by Nguyen because the unit disclosed by Medved et al. is specifically concerned with providing an interface between different types of communicating elements.

***Response to Arguments***

15. Applicants' arguments with respect to claims 11-24 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 703-605-1186. The examiner can normally be reached on Monday to Friday, 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4700.

M. R. Sedighian
M.R. SEDIGHIAN
Patent Examiner
Art Unit: 2633